GLOSSARY

Abatement	Reduction of greenhouse gas emissions, or enhancement of greenhouse gas removal from the atmosphere by sinks.
Allocation	In the modelling, an economy's allocation of emission rights is determined by the assumed international emission reduction agreement.
Allocative efficiency	Reference to the efficiency with which markets allocate resources. When the input mix of an economy is consistent with cost minimisation and where no externalities in production exist, the economy's allocative efficiency is maximised. A market is allocatively efficient if it produces the right goods for the right people at the right price.
Annex B countries	Annex B of the Kyoto Protocol lists countries that have a quantified greenhouse gas emission limit or reduction commitment in the period 2008–12.
Anthropogenic greenhouse gases	Greenhouse gases released due to human activities.
Australia's Low Pollution Future (ALPF) report	Australian Government report on the economics of climate change mitigation, released by the Treasurer and the Minister of Climate Change and Water on 30 October 2008.
Banking	The ability to hold permits for use in the future.
Base-load demand	The minimum amount of power that a utility or distribution company must make available to its customers, or the amount of power required to meet minimum demands based on reasonable expectations of customer requirements.
Biofuel	A fuel composed of or produced from biological raw materials.
Biomass	Biological material from living, or recently living organisms, such as wood, waste and (hydrogen) gas.
Borrowing	The use of future permits to meet current obligations under an emissions trading scheme.
Bottom-up model	A detailed, sector specific model, often with engineering detail. This report uses bottom-up models for the electricity generation, transport and land use change and forestry sectors.

Cap-and-trade scheme	A limit (or cap) on certain types of emissions or pollutions is set, and firms can sell (or trade) the unused portion of their limits to other firms that are struggling to comply.
Carbon capture and storage (CCS)	Technology to capture and store greenhouse gas emissions from energy production or industrial processes. Captured greenhouse gases can be stored in various geological sites.
Carbon dioxide (CO_2)	A naturally occurring gas. It is also a by-product of burning fossil fuels and biomass, other industrial processes and land use changes. It is the main greenhouse gas that affects anthropogenic changes to the earth's temperature.
Carbon dioxide equivalent (CO_2-e)	A standard measure that takes account of the different global warming potentials of greenhouse gases and expresses the cumulative effect in a common unit.
Carbon Farming Initiative (CFI)	The Australian Government's Carbon Farming Initiative is a carbon offset scheme to establish a carbon crediting mechanism; fast-tracked development of methodologies for offset projects; and information and tools to help farmers and landholders benefit from carbon markets.
Carbon leakage	An increase in global emissions, arising from the relocation of emission-intensive production activity in response to the introduction of a carbon price.
Carbon price	The cost of releasing greenhouse gases into the atmosphere See emission price.
Carbon Pollution Reduction Scheme (CPRS)	The Carbon Pollution Reduction Scheme (CPRS) was a cap-and-trade emissions trading scheme (ETS) developed by the Australian Government to reduce Australia's greenhouse gas emissions.
Carbon sinks	Natural or man-made systems that absorb and store carbon dioxide from the atmosphere, including plants, soils and oceans.
Clean Development Mechanism (CDM)	A mechanism under the Kyoto Protocol through which developed countries may undertake greenhouse gas emission reduction or removal projects in developing countries, and receive credits for doing so. They then may apply these credits to meet their own mandatory emissions targets.
Climate change	A change of climate attributed directly or indirectly to human activity that alters the composition of the global atmosphere and is in addition to natural climate variability over comparable time periods.
Computable General Equilibrium (CGE) model	A CGE model is a whole-of-economy model that captures the interactions between different sectors of the economy.

Contraction and convergence approach	An approach to international emission allocation where initial national allocations reflect actual emission levels at the start of the scheme, but over time, converge to an equal per capita basis.
Coverage	The scope of an emissions trading scheme. Covered sectors are liable for their emissions under the scheme.
Deforestation	The conversion of forested land to an alternative, non-forest use.
Dry cooling	Cooling towers used to transfer process waste heat to the atmosphere.
Economic model	Economic models mathematically represent how the economy operates and how various agents respond to changing signals.
Emission	Release of greenhouse gases into the atmosphere.
Emission intensity	The ratio of emissions to output. Emission intensity can refer to both emissions per unit of sectoral output (such as the emission-intensity of electricity generation) and the emissions per unit of economy-wide output (which usually refers to GDP). Also called carbon intensity.
Emission-intensive, trade exposed (EITE) industries	Industries that either export or compete against imports (trade exposed) and produce significant emissions in their production of goods.
Emission permit	The right to release a specified quantity of greenhouse gas under an emissions trading scheme.
Emission price	The cost of releasing greenhouse gases into the atmosphere. Often referred to as the carbon price.
Emissions trading scheme	A scheme that creates a market for emission rights by limiting the total amount of emissions. Market participants then buy and sell rights to emit greenhouse gases.
Endogenous	A variable which is generated within the model.
Energy Sector Model (ESM)	A partial equilibrium model developed by CSIRO to model the Australian energy sector, with detailed transport sector representation. The model has an economic decision-making framework, based around the cost of alternative fuels and technologies.
Exogenous	A variable which is generated outside the model.
Externality	When the production or consumption of goods and services imposes costs or benefits on others not reflected in the prices charged.

Factor cost	The cost of a good or a service in terms of the various factors that have played a part in its production or availability, and exclusive of tax costs.
Fuel switching	The substitution of one type of fuel for another, for example the use of natural gas instead of coal. Fuel switching changes the emission intensity of energy production because the carbon content of fuels varies.
Fugitive emissions	Greenhouse gases released in the course of oil and gas extraction and processing, through leaks from gas pipelines, and as waste methane from black coal mining.
GCOMAP model	A model used by the Lawrence Berkeley National Laboratory to model the forestry sector overseas. GCOMAP simulates how forest land users respond to changes in prices in forest land and products to emission prices.
General Equilibrium Modelling Package (GEMPACK)	A suite of economic modelling software, suitable for computable general equilibrium models. GEMPACK is the software platform on which GTEM and MMRF are implemented.
Geothermal energy	Thermal energy generated and stored in the Earth.
Gigatonne (Gt)	One billion (10^9) tonnes.
Gigawatt hour (GWh)	A unit of energy equal to one billion watt hours.
Global Trade and Environment Model (GTEM)	Developed by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) and extended by Treasury, GTEM is a global model which provides insights into Australia's key international trading partners. The version of GTEM used disaggregates the world into 13 geographic regions and 19 industrial sectors (see Modelling Framework for more details).
Global warming potential	A system of multipliers devised to enable the comparison of the warming effects of different gases. For example, over the next 100 years, a gram of nitrous oxide in the atmosphere is currently estimated as having 310 times the warming effect as a gram of carbon dioxide.
Greenhouse gases	Gases that cause global warming and climate change. The major greenhouse gases are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).
Greenhouse Gas Reduction Scheme (GGAS)	New South Wale's mandatory greenhouse gas emissions trading scheme started on 1 January 2003. GGAS aims to reduce greenhouse gas emissions associated with the production and use of electricity by using project-based activities to offset the production of emissions.

Groningen Growth and Development Centre	Research centre within the Economics Department of the University of Groningen. The research is largely based on a range of comprehensive databases on indicators of growth and development.
Gross domestic product (GDP)	The total market value of all final goods and services produced in an economy.
Gross domestic product (GDP) deflator	An economic metric that accounts for inflation by converting output measured at current prices into constant-dollar GDP. The GDP deflator shows how much a change in the base year's GDP relies on changes in the price level.
Gross national income (GNI)	This reflects changes in GDP, the terms of trade and international income transfers. It is measured as GDP less net taxes on production and imports, less compensation of employees and property income payable to the rest of the world, plus the corresponding items receivable from the rest of the world.
Gross output	The value of an industry's output is the value of inputs produced by other industries used in the production process (intermediate inputs) plus gross value added and any taxes, less subsidies on production. Gross output is a measure of turnover or activity.
Gross state product (GSP)	The total market value of all goods and services produced in a particular state or territory.
Gross value added (GVA)	GVA measures the returns accruing to owners of the primary factors, such as land, labour and capital used in the production process, plus taxes less subsidies on production. GDP is the sum of GVA across industries.
Gross world product (GWP)	Aggregate market value of all final goods and services produced worldwide in a given year.
Harberger triangles	Measures the net welfare loss, or deadweight loss, due to a market distortion or policy.
Hotelling rule	Derived from resource economics, the Hotelling rule explains the growth in the price of finite resources. The emission price follows a Hotelling rule, whereby it grows at the real interest rate from a specified starting level.
Hot rocks	Rocks beneath the Earth's surface with a high temperature. Hot rocks can be used to create geothermal energy by pumping cold water and making use of the rising hot water which the rocks have heated.
Hybrid vehicles	Vehicles that use two or more distinct power sources. The term most commonly refers to hybrid electric vehicles, which combine an internal combustion engine and one or more electric motors.

Intergovernmental Panel on Climate Change (IPCC)	Established in 1988, the IPCC surveys worldwide scientific and technical literature and publishes assessment reports widely recognised as the most credible existing sources of information on climate change.
Kyoto Protocol	An international treaty that sets binding targets to limit greenhouse gas emissions by individual developed countries to be met within the first commitment period, 2008–12.
Land use, land use change and forestry (LULUF)	A reporting category comprising agriculture emissions (land use), and emissions from deforestation (land use change) and carbon sequestered through reforestation (forestry).
Large scale renewable energy target (LRET)	A scheme implemented through the Renewable Energy (Electricity) Act 2000 and the accompanying Renewable Energy (Electricity) Regulations 2001 to create a financial incentive to establish and grow renewable energy power stations, such as wind and solar farms, or hydro-electric power stations.
Learning by doing	Reductions in technology costs due to greater use of a technology, such as through incremental innovation.
Legacy waste	Waste deposited in landfill before 1 July 2012.
Marginal cost of mitigation	The cost of reducing emissions by one additional unit.
Marginal product	The output produced by one more unit of a given input.
Market exchange rate (MER)	The rate of exchange between currencies in foreign exchange markets. See purchasing power parity exchange rate.
Market failure	A situation where the market is unable to provide an efficient level of production and consumption of goods and services, including natural resources or ecosystem services. In the climate change context, market failure arises because those emitting greenhouse gases do not bear all the risks of adverse climate change impacts from emissions, but share them across the world.
Megatonne (Mt)	One million (10^6) tonnes.
Megawatt hour (MWh)	A unit of energy equal to one million watt hours.
Mitigation	A human intervention to reduce the sources of, or enhance the sinks for, greenhouse gases.
Mitigation cost	The proportional decline in economy-wide activity that occurs as a result of reducing emissions. This is distinct from the marginal cost of mitigation which refers to the cost of reducing a unit of emissions. Regions which have a high marginal cost of mitigation do not necessarily have high mitigation costs.

Model for the Assessment of Greenhouse Gas Induced Climate Change (MAGICC)	A model used to estimate the atmospheric concentrations of emission trajectories from the international reference scenarios derived in GTEM.
Monash Multi-Regional Forecasting (MMRF) model	MMRF, developed by the Centre of Policy Studies at Monash University, models the Australian economy. It has 58 industrial sectors, and provides results for all eight states and territories.
Multi-stage approach	An approach to international allocation where the number of economies participating in global mitigation gradually expands.
National Energy Modelling Systems (NEMS)	A computer-based, energy-economy modelling system of the United States energy market, created by the US Energy Information Administration.
Nominal emission price	The emission price in current dollars (that is, including the effects of inflation).
ORANI	An applied general equilibrium model developed at Monash University.
Photovoltaics	Materials and devices that convert sunlight into electrical energy.
Policy scenario	A projection of the future path of the global and Australian economy if policies to reduce emissions are introduced.
Price Revenue Incidence Simulation Model (PRISMOD.IO)	A large-scale highly disaggregated model of the Australian economy developed by Treasury that captures the flows of goods between industries and final consumers. PRISMOD.IO models the impact of a carbon price on households and the consumer price index.
Price Revenue Incidence Simulation Model and Distribution Model (PRISMOD.DIST)	A static micro simulation model developed by Treasury that examines the distributional effects of government policies on spending by different households.
Productivity	A measure of output from a production process per unit of input. For example, labour productivity is typically measured as output per worker or output per hour worked.
Purchasing Power Parity (PPP) exchange rates	Hypothetical exchange rates that adjust for differences in prices levels across countries. Under a PPP exchange rate, one Australian dollar buys the same amount of goods and services in every country: no more, no less. Also see market exchange rate.
Quintile	The set of four variate values which divide the total frequency into five equal parts.

Real emission price	The emission or carbon price in constant dollars (that is, without the effects of inflation).
Reference scenarios	The two international reference scenarios incorporate world action to stabilise greenhouse gas concentration levels at around either 550 or 450 parts per million by around 2100. They provide a credible and realistic backdrop to examine the introduction of a domestic carbon price.
Renewable energy	A source of energy that is not depleted by use. Renewable technology includes hydro, biomass, solar, wind and geothermal sources.
ROAM Consulting model	A highly detailed model that provides analysis of the Australian electricity generation sector, with projections for levels of generation, total capacity, emissions, energy use (fuel use), wholesale and retail electricity prices and the profit streams of generators.
Scenario modelling	Scenario modelling is an assessment of what *could* happen in the future, given the structure of the models and input assumptions. It is not a prediction of what *will* happen in the future.
Sensitivity analysis	A technique for systematically changing variables in a model to determine the effects of those changes.
Sequestration	The removal of atmospheric carbon dioxide, either through biological processes (such as photosynthesis in plants), or geological processes (such as storage of carbon dioxide in underground reservoirs).
Sinclair Knight Merz – McLennan Magasnik Associates(SKM-MMA) model	A highly detailed model that provides analysis of the Australian electricity generation sector, with projections for levels of generation, total capacity, emissions, energy use, wholesale and retail electricity prices and the profit streams of generators.
Small-scale Renewable Energy Scheme (SRES)	A scheme implemented through the *Renewable Energy (Electricity) Act 2000* and accompanying *Renewable Energy (Electricity) Regulations 2001* to create a financial incentive for owners to install eligible small-scale installations such as solar water heaters, heat pumps, solar panel systems, or small-scale wind systems.
Social Accounting Matrix (SAM)	A framework for organising information about income, expenditure and financial flows in the economy at a point in time.
Solar thermal energy	Technology for harnessing solar energy to generate electricity.
Solow-Swan type growth model	A neoclassical growth model.

Stabilisation	Reference to the stabilisation of the atmospheric concentration of greenhouse gases in the atmosphere. This occurs when the amount of greenhouse gases released into the atmosphere matches the earth's capacity to absorb greenhouse gases.
Static Incomes Model (STINMOD)	The National Centre for Social and Economic Modelling's (NATSEM) static microsimulation model of Australia's income tax and transfer system.
Stationary energy	Stationary energy is the largest contributor to energy sector emissions. Stationary energy includes emissions from fuel consumption for electricity generation, fuels consumed in the manufacturing, construction and commercial sectors, and other sources like domestic heating and direct combustion of fuels.
Technical efficiency	The effectiveness with which a given set of inputs are used to produce an output (that is, productivity). A production process that achieves the maximum possible output, given a fixed set of inputs and technology, is fully technically efficient.
Terawatt hour (TWh)	A unit of energy equal to one trillion (10^{12}) watt hours.
Terms of trade	The ratio of the price of an economy's exports to the price of its imports. If the ratio rises, the terms of trade improve.
Thermal efficiency	The ratio of electricity generated to energy input.
Top-down model	A top-down model breaks down a system to gain insight into its compositional sub-systems. This report uses GTEM as the top-down model for the global economy and MMRF as the top-down model of the Australian economy.
United Nations Framework Convention on Climate Change (UNFCCC)	An international treaty adopted after the Rio Earth Summit in 1992 and aimed at achieving the stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.